WHAT IS CLAIMED IS:

1. A simplified de-correlation method in TD-SCDMA multi-user detection characterised in that is comprises:

a. Receive wireless symbols S;

b. Obtain a channel correlation matrix R, take one part from R and get a partial correlation matrix $\mathbf{R}_P$;

c. Do inversion operation to the partial correlation matrix $\mathbf{R}_P$, then obtain matrix $\mathbf{V}^{(m)}$;

d. Recover original data symbols D from received symbols S by $\mathbf{V}^{(m)}$ that the location of original data symbols D corresponds to.

2. A simplified de-correlation method in TD-SCDMA multi-user detection of claim 1, characterised in that said partial correlation matrix $\mathbf{R}_P = \{r_{i,j}\}$ $i,j = 1...(2P+1)K$, said partial correlation matrix $\mathbf{R}_P$ is submatrix of channel correlation matrix R on diagonal, said K is the user number in one time slot, wherein said P is the symbols number earlier than or latter than current symbols and have influence to current symbols.

3. A simplified de-correlation method in TD-SCDMA multi-user detection of claim 2, characterised in that said $\mathbf{V}^{(m)} = \{v_{i,j}^{(m)}\}$, wherein

$$v_{i,j}^{(m)} = \left(\mathbf{R}_P^{-1}\right)_{i+(m-1)K,j}, \quad i = 1...K, j = 1...(2P+1)K, m = 1...2P+1$$

4. A simplified de-correlation method in TD-SCDMA multi-user detection of claim 1, characterised in that the location of original data symbols D have three situation:

1) when $1 \le n \le P$, $\mathbf{V}^{(m)} = \mathbf{V}^{(n)}$, $\mathbf{D}^{(n)}$ can be recovered as $\hat{\mathbf{D}}^{(n)} = \mathbf{V}^{(n)}\mathbf{S}_P^{(n)}$

2) when $P+1 \le n \le N-P$, $\mathbf{V}^{(m)} = \mathbf{V}^{(\mathrm{P+1})}$, $\mathbf{D}^{(n)}$ can be recovered as $\hat{\mathbf{D}}^{(n)} = \mathbf{V}^{(\mathrm{P+1})}\mathbf{S}_P^{(n)}$

3) when $N+1-P \le n \le N$, $\mathbf{V}^{(m)} = \mathbf{V}^{(\mathrm{2P+1+}n\mathrm{-N})}$, $\mathbf{D}^{(n)}$ can be recovered as $\hat{\mathbf{D}}^{(n)} = \mathbf{V}^{(\mathrm{2P+1+n-N})}\mathbf{S}_P^{(n)}$, said $\hat{\mathbf{D}}^{(n)}$ is the estimation of original symbol, said n is location of chip.

5. A simplified de-correlation method in TD-SCDMA multi-user detection of claim 1, characterised in that:

When $P+1 \le n \le N-P$, received wireless symbols S can be defined as

$$\mathbf{S}_P^{(n)} = \left(\underbrace{\hat{s}_1^{(n-P)}, \hat{s}_2^{(n-P)}, \ldots, \hat{s}_K^{(n-P)}}_{\text{n-P}^{\text{th}}\text{ symbols of all K users}}, \ldots\ldots, \underbrace{\hat{s}_1^{(n)}, \hat{s}_2^{(n)}, \ldots, \hat{s}_K^{(n)}}_{\text{n}^{\text{th}}\text{ symbols of all K users}}, \ldots\ldots, \underbrace{\hat{s}_1^{(n+P)}, \hat{s}_2^{(n+P)}, \ldots, \hat{s}_K^{(n+P)}}_{\text{n+}P^{\text{th}}\text{ symbols of all K users}} \right),$$

wherein, said $\hat{s}_1^{(n-P)}, \hat{s}_2^{(n-P)}, \cdots, \hat{s}_k^{(n-P)}$ is (n-P)th symbols of all K users, said $\hat{s}_1^{(n)}, \hat{s}_2^{(n)}, \cdots, \hat{s}_k^{(n)}$ is（n）th symbols of all K users, said $\hat{s}_1^{(n+p)}, \hat{s}_2^{(n+p)}, \cdots, \hat{s}_k^{(n+p)}$ is（n+P）th symbols of all K users;

When $1 \le n \le P$, received wireless symbols S can be defined as

$$\mathbf{S}_P^{(n)} = \left(\underbrace{\hat{s}_1^{(1)}, \hat{s}_2^{(1)}, \ldots, \hat{s}_K^{(1)}}_{1^{\text{st}}\text{ symbols of all K users}}, \ldots\ldots, \underbrace{\hat{s}_1^{(n)}, \hat{s}_2^{(n)}, \ldots, \hat{s}_K^{(n)}}_{\text{n}^{\text{th}}\text{ symbols of all K users}}, \ldots\ldots, \underbrace{\hat{s}_1^{(2P+1)}, \hat{s}_2^{(2P+1)}, \ldots, \hat{s}_K^{(2P+1)}}_{\text{2P+1}^{\text{th}}\text{ symbols of all K users}} \right)$$

Here, said $\hat{s}_1^{(1)}, \hat{s}_2^{(1)}, \cdots, \hat{s}_k^{(1)}$ is 1th symbols of all K users, said $\hat{s}_1^{(n)}, \hat{s}_2^{(n)}, \cdots, \hat{s}_k^{(n)}$ is（n）th symbols of all K users, said $\hat{s}_1^{(2P+1)}, \hat{s}_2^{(2P+1)}, \cdots, \hat{s}_k^{(2P+1)}$ is 2P+1th symbols of all K users;

When $N+1-P \le n \le N$, received wireless symbols S can be defined as

$$\mathbf{S}_P^{(n)} = \left(\underbrace{\hat{s}_1^{(N-2P)}, \hat{s}_2^{(N-2P)}, \ldots, \hat{s}_K^{(N-2P)}}_{\text{N-2P}^{\text{th}} \text{ symbols of all K users}}, \ldots\ldots, \underbrace{\hat{s}_1^{(n)}, \hat{s}_2^{(n)}, \ldots, \hat{s}_K^{(n)}}_{\text{n}^{\text{th}} \text{ symbols of all K users}}, \ldots\ldots, \underbrace{\hat{s}_1^{(N)}, \hat{s}_2^{(N)}, \ldots, \hat{s}_K^{(N)}}_{\text{N}^{\text{th}} \text{ symbols of all K users}} \right)$$

wherein, said $\hat{s}_1^{(N-2p)}, \hat{s}_2^{(N-2p)}, \cdots, \hat{s}_k^{(N-2p)}$, is N-2p th symbols of all K users, said $\hat{s}_1^{(n)}, \hat{s}_2^{(n)}, \cdots, \hat{s}_k^{(n)}$, is n th symbols of all K users, and said $\hat{s}_1^{(N)}, \hat{s}_2^{(N)}, \cdots, \hat{s}_k^{(N)}$, is N th symbols of all K users.

6. A simplified de-correlation method in TD-SCDMA multi-user detection of claim 2, characterised in that said $1 \leqslant K \leqslant 16$.

7. A simplified de-correlation method in TD-SCDMA multi-user detection of claim 2, characterised in that said P is integer, said N is 22.

8. A simplified de-correlation method in TD-SCDMA multi-user detection of claim 7, characterised in that said P is 2.

9. A UE system in TD-SCDMA characterised in that is comprises:

a correspond calculate equipment to define the partial correlation matrix $\mathbf{R}_P$;

a draw out and inversed matrix equipment to define new matrix $\mathbf{V}^{(m)}$; and

a matrix-vector multiplication to multiply received wireless symbols S by said matrix $\mathbf{V}^{(m)}$;

10. A UE system in TD-SCDMA of claim 9 characterised in that is also comprises K matching filters and K buffer storages which connected correspond to said matching filter one by one.